

# Zero Retries issue 0232 2025-12-12

*Zero Retries is an independent newsletter promoting technological innovation in and adjacent to Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Radios are computers - with antennas! Now in its fifth year of publication, with 3300+ subscribers.*

About Zero Retries

## Steve Stroh N8GNJ, Editor

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On the web: <https://www.zeroretries.org/p/zero-retries-0232>

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#### Request To Send

*Commentary by Editor Steve Stroh N8GNJ*

#### Paid Subscribers Update

My thanks to **John Alley K4UAE** for *renewing* as an **Annual Paid Subscriber** to Zero Retries this past week!

My thanks to **Prefers to Remain Anonymous 112** for *upgrading* from a free subscriber to Zero Retries to an **Annual Paid Subscriber** this past week!

My thanks to **Prefers to Remain Anonymous 114** for *upgrading* from a free subscriber to Zero Retries to an **Annual Paid Subscriber** this past week!

My thanks to **Prefers to Remain Anonymous 113** for *upgrading* from a free subscriber to Zero Retries to a **Paid Subscriber** this past week!

*Financial support from Zero Retries readers is a significant vote of support for the continued publication of Zero Retries.*

#### Big... Overflowing... Issue of Zero Retries

*This has been an exceptionally Zero Retries Interesting week!*

I thought the big news in Zero Retries this week was going to be the launches of the **Zero Retries email list**, the **Zero Retries YouTube channel**, and one of the first Zero Retries Guides (of a long, *long* list of subjects) - **Zero Retries Guide to Amateur Radio HF Data Communications**.

But then came news that **44Net Connect had officially launched** (which I had been calling 44Net VPN).

That prompted me to start writing a brief article about Starlink Mini, Starlink Standby service, and 44Net Connect and a powerful fusion of those three developments. Given the already large size of this issue of Zero Retries, and even more Zero Retries Interesting developments this week (read on...), I punted *that* article forward to the next issue.

This was also the week of the month that Kay Savetz K6KJN contributes their monthly column **What's New at Digital Library of Amateur Radio & Communications** (which I always read immediately when it hits my email inbox).

*But the Zero Retries Interesting stuff just kept coming...*

There was the news that the **ARRL will be sponsoring HamSCI 2026** in Connecticut, USA. *It's so cool* to see that ARRL has resumed

actively sponsoring *technical conferences* relating to Amateur Radio!

Glenn Allison N3MEL wasted no time after the soft launch of the Zero Retries email list to publish **The TPRFN Connection: December 2025 Newsletter** on the new list (reprinted in this issue).

My colleague in writing Zero Retries Interesting Amateur Radio content, Tom Salzer KJ7T of the **Random Wire newsletter** chose *this* week to bring his new project out of stealth mode - **EtherHam**.

And lastly... the biggest Zero Retries Interesting news this week is that the US FCC formalized its regulations (and thus, it's official, and permanent) the **US Amateur Radio 60m band**, with a Zero Retries Interesting twist.

And of course, there are also the *many* interesting short items that I mention in the **ZR > BEACON** section which, of late, I have to severely triage for inclusion in Zero Retries. One of the many blessings of the Zero Retries email list is that when there's an item for ZR > BEACON that I just don't think I can fit into Zero Retries (it's *always* too big...) I can now post it to the Zero Retries email list with the hashtag [#zrbeacon](https://t.me/zrbeacon).

If you've read this far in your email client, save yourself some frustration and click the link at the start of this issue to launch this issue in a web browser. That enables you view the *entire* newsletter, not just the initial portion that your email client is willing to display.

### Weekends Are For Amateur Radio!

Have a great weekend, all of you co-conspirators in Zero Retries Interesting Amateur Radio activities!

Western Washington USA (Seattle metro area to the Canada border) has experienced record new flood levels this week and continuing through this weekend. We just got a helluva lot of rain, including the nearby mountains which melted snowpack. All that extra water couldn't be absorbed quickly so it goes to the rivers, which overflow their usual boundaries. Several low-lying cities in Whatcom County are completely flooded. Thanks to those Zero Retries readers that checked in with Tina and I - our house is safely away from flood danger and we're doing fine.

Steve N8GNJ

[Leave a comment](#)

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## Zero Retries Email List

By Steve Stroh N8GNJ



Image courtesy of groups.io

*Now it can be told. I've teased / hinted this project periodically for the past year (at least). I've finally created the Zero Retries email list:*

<https://groups.io/g/zeroretries>

I intend that the Zero Retries email list will replace Substack comments as Zero Retries transitions to a new publishing platform in 2026. I don't intend to enable comments on the new publishing platform. On the new publishing platform, from the beginning I will direct comments to the Zero Retries email list.

A secondary purpose of the Zero Retries email list is to *extend and continue* discussions about Zero Retries Interesting topics.

### Why Set Up a Zero Retries Email List?

Basically... *I am not a subject matter expert about most of the things I write about in Zero Retries*. Zero Retries only exists because there is so much interesting Technological Innovation in Amateur Radio... and I am mostly just reporting out about those developments.

I've had some help over the years in writing about Zero Retries Interesting developments, such as my wonderful friend and Zero Retries Pseudostaffer Kay Savetz K6KJN contributing a monthly column in Zero Retries about cool new stuff coming into Digital Library of Amateur Radio & Communications. But folks willing to write an article for Zero Retries are rare (compared to the amount of innovation that's actually happening).

Thus, setting up the Zero Retries email list provides a venue, a community to mention Technological Innovation in Amateur Radio - that's less formal / scary than writing an article in Zero Retries. And... when someone posts something, folks can immediately interact with the poster / subject, to the enrichment of us all.

### An Email List? On the Cusp of 2026?

For those that think that email lists are an electronic discussion system straight out of the previous century... you're right.

The 21st century preferred electronic discussion system seems to be Discord.

*I get that, and don't disagree.*

*This is especially painful because my new Amateur Radio friends in the GNU Radio community that I met at GRCon 2025 were pretty unanimous that they don't have any bandwidth for email lists. Their only venue for communicating amongst themselves about Amateur Radio use of GNU Radio... is Discord.*

In short, a groups.io email list is the solution I've chosen for the first implementation of a Zero Retries community. I don't have the personal bandwidth for maintaining a Zero Retries presence on Discord. *I wish I did!*

As a recommendation for the Zero Retries email list, a Zero Retries reader, via private email, said it well:

The Zero Retries mailing list is awesome. Not only does it free comments from Substack, but it frees general comments from any particular ZR issue. Makes it more of a "community". Not to mention all the other great things about mailing lists: searchable, archive-able, etc.

One thing I really love about groups.io is when there is an interesting discussion, it can be *cleanly linked to* with a URL that can be shared out.

I intend to continue at least a cursory Zero Retries presence, and some interaction, on [Mastodon](#) and [Bluesky](#) - apologies to followers there - I've been less than diligent of late about posting updates.

### **Why *Not* the Substack Comments System?**

In my opinion, the Substack comments system is poorly implemented. Comments are silo'd into each individual issue, the existence of a comment system isn't very visible, there's no continuity from issue to issue, and the signup process with Substack is onerous (from reports I've gotten from readers who wanted to comment, and gave up trying to create an account to be able to comment).

In addition, one of the best parts of Zero Retries is that there are now nearly 3400 readers who are email subscribers, and untold number of readers who aren't email subscribers, reading via RSS, social media, pass-along, etc. Thus the new Zero Retries email list is a way to begin forming *a community* within the Zero Retries readership. Zero Retries readers... and co-conspirators for technological innovation in Amateur Radio, can "discuss amongst themselves" and support each other, on the Zero Retries email list.

### **Priority of Onboarding Participants**

The first few waves of invitations to join the Zero Retries email list have already gone out to Founding Members, Pseudostaffers, Paid Subscribers, ZRDC attendees, Guest Authors, and those who have offered insightful comments (on Substack) since Zero Retries 0220.

*Note that Substack commenter names aren't directly translatable to [Substack] email subscribers, so for some of you "insightful commenters" I was not able to find an email address to invite you.*

*My goal with the Zero Retries email list is keep the signal to noise ratio high on the list. Generally, I'd like to keep the discussions to the same subjects discussed in Zero Retries - "Zero Retries Interesting".*

### **Floodgates Open - Briefly**

I briefly... (hilariously, in hindsight) imagined manually vetting all applicants as (*nearly 3400!*) email subscribers to Zero Retries, but that's not feasible.

But I don't want to enable automatic additions to "anyone" - that's a de facto invitation for the list to be spammed. Thus, my temporary compromise is between manageability and spam protection is...

*between Friday 2025-12-12 and Sunday 2025-12-14...*

I will suspend manual approval of new subscribers.

After that window, manual approval for subscriptions will be reinstated.

My thinking is that notification of the existence of the Zero Retries email list will be published first in this issue of Zero Retries, offering regular Zero Retries readers a reasonable chance to subscribe quickly to the Zero Retries email list with no barrier.

### **Article Tagging**

I hope to make good use of hashtags (#) on the Zero Retries email list.

One example is:

[#hfddata](#)

which displays discussions of the use of HF data communications.

For each story in Zero Retries, instead of the Substack

Leave a comment

button I've used to date, I'll be displaying an email link with a hashtag of the current Zero Retries issue and a general hashtag about the subject. For example:

**To comment on this article on the Zero Retries email list, [click here](#).**

*This process will be a work in progress for some time.*

### ***The List Sounds Interesting, But I'd Rather Not Subscribe***

If you're a "I'd rather not put my email address out in the open on an email list" kind of person, or you prefer to "lurk" (passively observe)... I understand.

Note that the archives of the email list are public:

<https://groups.io/g/zeroretires/messages>

so *anyone* can follow the conversations on the list.

Also, the archives of the email list are accessible via RSS:

<https://groups.io/g/zeroretires/rss>

While there will be some overlapping discussion with other email lists (and other discussion systems), detailed discussion (such as troubleshooting) will be deferred to email lists / discussion systems that are specifically for supporting specific topics.

One example is troubleshooting Dire Wolf technical issues should be deferred to the **Dire Wolf Software TNC** email list -

<https://groups.io/g/direwolf>.

*The Zero Retries email list will be very much a work in progress - for months.*

Some future work:

- Appointing moderators; eventually the spammers will come.
- Populating the Wiki of other email lists / discussion systems for supporting specific topics better than on the Zero Retries email list.

**To comment on this article on the Zero Retries email list, [click here](#).**

## **What's New at Digital Library of Amateur Radio & Communications — December 2025**

By Kay Savetz K6KJN

Internet Archive's Program Manager, Special Collections

DLARC has added an enormous trove of publications from AMSAT, the Radio Amateur Satellite Corporation, with the gracious permission of the organization. Formed in 1969, AMSAT designs, builds, launches, and operates satellites carrying amateur radio payloads. In addition to keeping amateur radio in space for 55 years, AMSAT has created a variety of publications, many of which are now in the DLARC library.

DLARC now offers a tantalizingly, nearly complete collection of the [AMSAT Amateur Satellite Report](#) newsletter — from the first issue in February 1981 through issue 193 in 1990. (Only three issues are missing: 147, 189, 190...and any past issue 193 if those were published.)

And! DLARC has added 96 issues the AMSAT Journal, bringing it to 228 issues in the [AMSAT Newsletter and AMSAT Journal](#) collection. Also in that collection are [19 issues of Orbit](#), a glossy magazine sporadically published by AMSAT from 1980 through 1984. Thanks to Paul Stoetzer, N8HM, AMSAT's Executive Vice President, for helping make all of these items available in DLARC.

While we're on the topic of satellite communications, we've added a bunch of historical satcomm material donated by Hank Magnuski KA6M. These [include several drafts](#) of the the AMICON System Specification draft ("This is a draft version of specifications for use of the data communications special service channel (L2) on the AMSAT Phase III satellite, the communications medium which serves as the foundation of the AMSAT International Computer Network (AMICON).") And a [1985 document describing](#) NASA's Advanced Communications Technology Satellite Program (ACTS). And a [AMSAT Orbital Prediction Program](#) in BASIC and Pascal programming languages. There's plenty more satellite communications history in [this amazing collection from KA6M](#).

All at once, the [QSL collection](#) at DLARC has grown from a smattering of cards here and there to an impressive collection of more than 50,000 cards and verifications. It started when the Badger Amateur Radio Society, a student organization at the University of Wisconsin-Madison (W9YT), scanned and [uploaded more than 17,600 QSL cards](#), some apparently going back to the club's founding year of 1930. The collection includes beautiful card designs from all over the world. More details about the digitization and archival project of the BARS QSL cards is at <https://qsla.hadleyso.com>.

Around that same time I heard from the National Radio Club ("the world's oldest and largest medium wave DX Club") which wanted to mirror [their collection](#) of QSL cards and verification letters. Ta da, DLARC's new [National Radio Club Verifications](#) collection contains more

than 38,000 cards and letters from ham radio stations, mediumwave, and broadcast AM/FM stations worldwide.

Apparently all this effort somehow put the idea of sharing QSL cards into the universe, because Joseph Harris of Columbus, Ohio scanned dozens of his dad's QSL cards from circa 1955-56, and my buddy Bill Lange started scanning [his dad's card collection](#). You, too, can scan your (or your family member's) QSL card collection and share them in the DLARC library. It's pretty easy, can be done in little batches, and is a great way to preserve your family's legacy as part of the radio hobby.

I've written about our collection of Bexar Wire, the newsletter of the San Antonio Radio Club, before. The club has been around a long time, and club members managed to unearth earlier editions of the newsletter: we were able to scan 144 additional issues of "San Antonio Radio Club Bulletin" and "The Exciter" spanning 1955 through 1978. We've also added dozens issues of the [California Historical Radio Club Journal](#) — the issues now span nearly 50 years, 1975 through 2024.

Also we've scanned [130 issues of The Horn Speaker](#), "the newspaper for the hobbyist of vintage sound and electronics" published by Jim Cranshaw N5FSL. It started circa 1969 with the title Antique Radio, and was soon renamed The Horn Speaker with the April 1972 issue. We have sporadic issues from 1973 through 1997. These issues are part of the lot donated to DLARC by the [SPARK Museum of Electrical Invention](#) [in Bellingham, WA].

In a separate Internet Archive project, folks have been working hard to scan issues of [ERIC from microfiche](#). ERIC is "Educational Resources Information Center", an online library of education research and information, sponsored by the U.S. Department of Education since 1966. This project has revealed a number of items of interest to ham radio, so I've added them to DLARC: including the Newsletter of the Language by Radio Interest Group. ("LBRIG Newsletter consists of news items, short articles, general information, and opinions on the subject of language learning by radio. Subjects discussed include guidelines for selecting and purchasing shortwave equipment, where to obtain broadcast directories...") Here's [the first year of issues](#) and [volume 2](#). Here's a 200-page document on [Building Telegraphs, Telephones, and Radios](#) for Middle School Children and Their Parents. Also, here's a 1986 treatise on [Amateur Radio Satellite Communications](#), and one from 1984 on [Antenna Construction and Propagation of Radio Waves](#).

Next month brings a new year! In 2026, written works published in 1930 will move into the public domain in the United States. Can't wait to share new old public radio material with you.

*Digital Library of Amateur Radio & Communications is funded by a generous grant from Amateur Radio Digital Communications ([ARDC](#)) to create a free digital library for the radio community, researchers, educators, and students. If you have questions about the project or material to contribute, contact me at [kay@archive.org](mailto:kay@archive.org).*

DLARC want list: <https://archive.org/details/dlarc-wantlist>

To comment on this article on the Zero Retries email list, [click here](#).

## The TPRFN Connection: December 2025 Newsletter

By Glenn Allison N3MEL

### Happy Holidays from The Packet Radio RF Forwarding Network!

As 2025 winds down, we celebrate another year of growth and increased resilience in our RF-Only digital messaging network. The holiday season is a perfect reminder of the importance of reliable connections, and that is precisely what we are building together!

### Network Update: Crossing the Digital Divide

The TPRFN is closing out 2025 with strong performance and a commitment to expand our fully RF-forwarded backbone. Our objective remains clear: **providing a stable, independent digital messaging layer for EMCOMMs (Emergency Communications)**. The primary challenge is **time**; there is a lot I would like to see get done in 2026, but having both a full-time job and a side seasonal business makes it difficult to get it all done. If there is anyone that would like to help with getting the profiles updated please let N3MEL know, the template is basically created just need to track down the current stations data.

### November PKTNET Check-in Results

The **November PKTNET Exercise** demonstrated excellent coast-to-coast message handling, relying exclusively on **VARA HF** links between our Hub stations.

- **Key Success:** We saw some network latency for cross-region BBS-to-BBS message forwarding in 2025 due to solar storms. However, **VARA** continued to show its strength, giving the network its ability to continue to pass its traffic.
- **Areas for Improvement:** Propagation challenges on both 40 & 80 meters during a 24 hour period highlighted the need for more regional hub stations in the central US to better support NVIS paths.
- **Action Item:** The November 2025 PKTNET Results are now available on the TPRFN website. Be sure to check them out at this link: [click here](#)

### 2026 TPRFN Projects!

- **Skywarn:** Working on the details for handling Skywarn Spotter Reports using the BPQ RMS Service or if there is an internet outage somewhere in the network can be forwarded to different regions for delivery options. More info coming on this after the 1st of the year. But to get things started we have a prototype html to text spotter report available for testing at this link: [click here](#)
- **NTS Messages:** Need to get the full list of network stations that can handle NTS Traffic so that those that don't know where to forward them if you happen to receive one.
- **Profiles Page:** Working to get all the Hub Stations profiles up to date and added to a downloading document for field users to keep in their Go Kits.
- **Polling Stations:** Would like to get the Polling Stations profiles posted as well.

### **Call to Action: Seeking New Hub Stations!**

Are you a station with a reliable HF setup, a dedicated server running **BPQ32** (or equivalent), and a passion for digital resilience? We are actively seeking new Hub stations, especially in the following areas, to bolster our redundancy and fill coverage gaps:

- **See the current coverage map at this link:** [click here](#)
- **ANY AREAS:** with no stations are up for grabs. Use our ' [Contact Us](#) ' link to contact us if you have an interest.

Join us in making the TPRFN the most reliable, internet-free digital messaging network in the amateur radio community! Please fill out the inquiry form on our website to get started.

### **Tech Corner: BPQ Node Security and Maintenance**

With the new year approaching, now is the perfect time for basic node maintenance.

- **Password Review:** Ensure your BBS and Node passwords are up-to-date and complex. Although we operate in a trusted network, good digital security habits are critical.
- **Software Updates:** Please check for the latest versions of **BPQ32** and your chosen modem software (**VARA HF, ARDOP, PACTOR, etc.**). The developers frequently release patches that improve stability and speed.
- **Antenna Tune-Up:** Winter weather can be tough on antennas. A quick check of your SWR and cable connections now can prevent a failure during a critical communications event.

### **December Events: Practice Makes Perfect**

Don't let the holiday cheer distract you from getting on the air! December offers excellent opportunities to test your gear and practice digital modes:

Dec PKTNET: Starting a week early this month due to the Christmas Holiday. Starting Sat Dec 14<sup>th</sup> 00:00 UTC. For this month's instruction: [click here](#)

### **Happy Holidays and 73!**

Thank you to every sysop and participant for their dedication to building this essential network. Your commitment ensures that amateur radio remains a relevant and powerful tool for resilience in the face of any emergency.

We wish you and your families a safe, warm, and happy holiday season!

### **The TPRFN Network Team**

**Web:** <http://tprfn.net>  
**Email:** [tprfn@winlink.org](mailto:tprfn@winlink.org)

73 de Glenn Allison N3MEL  
 (tprfn) The Packet Radio Forwarding Network  
 EPA Hub Station  
[www.tprfn.net](http://www.tprfn.net)  
 Emergency Coordinator  
 Chester County ARES/RACES  
[www.w3eoc.org](http://www.w3eoc.org)

To comment on this article on the Zero Retries email list, [click here](#).

**Zero Retries YouTube Channel Is Live**

By Steve Stroh N8GNJ

Another project long in gestation, the **Zero Retries YouTube Channel** is live:

<https://www.youtube.com/@ZeroRetries>

Like many things, once you work up your courage and settle in for a few hours of patience and frustration at the keyboard (aided, at times, with an adult beverage), setting up a YouTube channel turns out to have been more daunting in *concept* (dread) than in *practice*.

*I really should have attempted this years ago.*

It did take a couple of hours of careful menu selections, including setting it up in a private browser tab so as not to confuse the creation of this new YouTube channel with my personal YouTube history or my gmail email address / Google ID.

### **ZRDC 2025 Conference Videos**

The first thing done was to upload the videos from ZRDC 2025, and they're now in a playlist:

[Zero Retries Digital Conference 2025](#)

### **Future Zero Retries Videos, Including Zero Retries Intro to... Series**

There will be many more videos uploaded to the Zero Retries YouTube channel in the coming months, including the start of the **Zero Retries Intro series**. Zero Retries Intros will be *short* (the goal is 5-10 minutes) video *presentations, narrowly focused on one Zero Retries Interesting topic*. Intros are not intended to be in-depth treatments. rather an overview of the most relevant points of a topic.

There won't be perfect alignment with the Zero Retries Guides pages, but pretty close. Eventually there will be a Guides page, an Intro video, and a chapter in my book-in-progress Zero Retries Guide to Amateur Radio in the 21st Century.

An example of a Zero Retries Intro topic is the 6-pin MiniDIN connector that's found on some Amateur Radio VHF / UHF radios (and modems) to provide flat audio for higher speed data communications (such as VARA FM) over VHF / UHF. This is (regrettably, in my opinion) usually called the "Data" connector ([Wikipedia and others call it the "9600 port"](#)), but the signals on that connector are *analog* "flat audio" with no (input) pre-emphasis (like the microphone input) or (output) de-emphasis (like the speaker output) applied to the audio signals.

Another example of a Zero Retries Intro topic would be why repeaters work so well to enhance wide area radio communications... and why digipeaters work barely, but generally poorly, in networks because of the [Hidden Node Problem](#).

A third example of a Zero Retries Intro topic, to keep to the short, narrowly focused theme of the Intros, explain how Time Division Multiple Access (TDMA) single channel repeater works, such as a few versions of Digital Mobile Radio (DMR) repeaters and radios can be made to work on a single channel using the first DMR time slot to receive, and the other DMR time slot to transmit, simultaneously.

I'm really looking forward to doing *many* Zero Retries Intro videos. I think they're the ideal blend of text, graphics, and presentation. One thing that's nicer about the Intros is that you can watch them as many times as necessary to understand the topic, and each one will have a link to the slide deck online, and all relevant references such as the Wikipedia article on the Hidden Node Problem, and of course, can be discussed at length on the new [zeroretries@groups.io](mailto:zeroretries@groups.io) email list.

And to answer a question / comment / criticism of my presentations being too text-heavy, *plaint heard* and I'm going to resort to asking an AI to create graphics to illustrate the points in the Intro videos.

**To comment on this article on the Zero Retries email list, [click here](#).**

### **[44Net Connect is Live!](#)**

John Burwell KI5QKX, ARDC's 44Net Program Manager, on the 44Net email list:

We're pleased to announce that 44Net Connect (formerly, "The PoP Project") is now live. This service provides a streamlined way for licensed hams to use 44Net resources using modern, secure networking tools.

<https://connect.44net.cloud/>

We're admitting users in batches to start. If you'd like to give it a try, head to the 44Net Connect dashboard <https://connect.44net.cloud/> to sign up and join the registration queue.

A huge thank you to Adam Lewis KC7GDY, who originated the concept; Zachary Seguin VA3ZTS, a chief collaborator; and John Hays K7VE SK, whose expertise and efforts were significant in bringing 44Net Connect to reality. We'd also like to recognize the 2024 and 2025 TACs and PoP subcommittees, who helped shepherd this project from "what if" to production-ready, and the beta testers who shared valuable feedback along the way.

We're excited to see how you'll use 44Net Connect and appreciate everyone who helped make it a reality.

This doesn't seem to be the official announcement from ARDC - I'll assume a bigger announcement targeted at the more general Amateur Radio population and media will be forthcoming.

Thus I'll forgive KI5QKX for burying the lede a bit in this announcement:

***44Net Connect is free for Amateur Radio users, for Amateur Radio activities.***

Free static IPv4 addresses (if you're an Amateur Radio Operator, intending to use a 44Net Connect IPv4 address for Amateur Radio use)!

*This is significant!* For example, you can only get a static IPv4 address from Comcast [if you sign up for the Comcast Business tier of service](#).

I had been calling this service 44Net VPN, but that was always a functional description (44Net Connect is, functionally, a Virtual Private Network - VPN).

That said, admittedly this name - **44Net Connect** is a cooler name as it lets you "connect" via 44Net.

Note that 44Net Connect is not Internet *access*. To use 44Net Connect, you have to already have Internet access. 44Net Connect is a functional layer *supplement* to your existing Internet access.

Also, there are no *services* provided by 44Net Connect - it is a solution to be able to use *static* IPv4 addresses from the 44Net IPv4 address pool, via any Internet connectivity. This is especially relevant for Internet access systems that used Carrier Grade Network Address Translation (CGNAT) that make it impossible to "come in" via IPv4 to a user's Internet systems - such as Starlink.

Note that when applying for 44Net Connect, you have to be verified as being an Amateur Radio Operator (have a current license). 44Net Connect will undoubtedly be inundated with applications, so please be patient (and kind) if it takes a while.

To comment on this article on the Zero Retries email list, [click here](#).

### **[FCC Allocates 60-Meter World-Wide Amateur Band Approved at WRC-15; Continues Amateur Use of Four Additional 60-Meter Channels...](#)**

*From the Editor: I'm citing the ARRL story on this development rather than creating an original story because ARRL (mostly) does a better job, from more depth, than I can offer on this development.*

ARRL News - 2025-12-11:

The Federal Communications Commission (FCC) on December 9, 2025, released a long-awaited [Report and Order](#) adopting a new amateur radio spectrum allocation in the 60-meter band that was approved for world-wide use on a secondary basis in the WRC-15 (World Radiocommunication Conference 2015) [Final Acts](#). The Commission also agreed with a petition from [ARRL](#) The National Association for Amateur Radio® to continue to allow amateur operations on four existing 60-meter channels outside the international allocation with a full 100 watts. **The new rules will go into effect 30 days after publication in the Federal Register, when amateurs may then begin using the allocation.**

Specifically, the Commission allocated 5351.5 - 5366.5 kHz (60 meters) to the amateur service **on a secondary basis with a permitted power of 9.15 watts ERP**. The Commission also authorized amateurs to continue using four existing channels outside of the 5351.5 - 5366.5 kHz band centered on 5332, 5348, 5373, and 5405 kHz on a secondary basis with a permitted power of 100 watts ERP. There are no antenna restrictions but antenna gain must be used to calculate ERP.

The 60-meter allocation is available to amateurs holding a General Class or above license. The maximum permissible signal bandwidth is 2.8 kHz.

Amateurs are cautioned that this allocation is strictly on a secondary basis, and amateurs must avoid interfering with non-amateur stations using this spectrum. This obligation includes the responsibility to monitor for such stations using appropriate receiver bandwidths. The FCC emphasized that "allowing amateur operations in this band while fully protecting incumbent primary Federal operations is our priority, and even intermittent interference in this band could jeopardize important Federal operations."

The Commission left open [ARRL's 2017 Petition for Rulemaking](#) to implement this WRC allocation (RM-11785), stating that "we expect the Commission may address any necessary power adjustments for the new 15 kilohertz international allocation in that proceeding." ARRL will be observing operations in the new band to evaluate the effect of the 9.15-watt limit and already has been monitoring the regulations and experiences of amateurs in other countries.

Finally, in the same Report and Order, the FCC updated 420 - 450 MHz coordination and contact information for geographic areas where the peak envelope power (PEP) of amateur stations operating is generally limited to 50 watts. There was no substantive change to the areas covered by the power limitation.

See the link for additional background from ARRL on the new 60m band.

I was tipped off to this development within hours of it being posted on the FCC website by a Zero Retries trusted source. I had glanced at the email from "trusted source" at an early hour (*their emails are always interesting*), and upon seeing this development, came instantly awake. ***Allocation of new spectrum for Amateur Radio operations by the FCC is a significant development!***

The most Zero Retries Interesting aspect of [this development](#) from the FCC is a mention of digital modes in justifying the comparatively low transmit power levels of the new US 60m band:

Some commenters argue that, due to the use of newer and more efficient digital modes, weak signals are not an impediment to sending information and the 15 W EIRP limit proposed by the NTIA is sufficient.

See page 23 for that mention.

To comment on this article on the Zero Retries email list, [click here](#).

## **Zero Retries Guide to Amateur Radio HF Data Communications**

By Steve Stroh N8GNJ

*A significant issue for Zero Retries readers, given Zero Retries is published serially in weekly installments, is the lack of continuity on specific subjects. No one can be expected to plow through 4 1/2 years of back issues of Zero Retries to get up to speed on a subject mentioned in Zero Retries. The Zero Retries Guides pages (in development) address that issue.*

My thanks to Wes Plouff AC8JF for inspiring this Zero Retries Guide by asking some good questions:

Last year, the FCC lifted the baud rate limitation for data modes on all HF bands except 60 meters. I know there is some activity on HF packet radio. Is there now any significant HF packet activity at data rates higher than 300 baud, and is there any emerging consensus on rates and frequencies? There may yet be more life in this “old” technology. Your readers (and I) might like to know whether HF packet radio is changing.

Instead of replying to AC8JF with a one-off private reply

*Heck Yes, there's a lot going on in Amateur Radio HF data communications that's a lot better than 300 bps AFSK packet radio!*

Thus I began writing this Zero Retries Guide, and the info came pouring out, and now not only can AC8JF benefit from that info, but anyone / everyone can.

The Zero Retries Guide to Amateur Radio HF Data Communications page is one of the first of (an extensive, eventually) set of reference pages about some Zero Retries Interesting subjects, projects, and concepts.

I got the inspiration for the Zero Retries Guides series a couple of years ago when I was asked to write a very small portion of the ARRL Handbook 100th Edition regarding a data communications mode. I realized that what I was writing was much more broadly applicable and useful, and shouldn't be confined to looking something up in the ARRL Handbook.

The intent of the Zero Retries Guides is to be able to drop a reference to a Zero Retries Guide page into a discussion in Zero Retries about a new development being discussed. For example, this is what I'll be posting in articles as I develop additional Zero Retries Guides:

*For background information on this subject, see:*

***Zero Retries Guide to Amateur Radio HF Data Communications***

Those that are already knowledgeable of a subject in an article can just keep reading about the new development. Those that don't have much background on the new development can click on the Zero Retries Guide link to get up to speed on the subject.

The benefit to me is that I don't have to dig out previous references in Zero Retries (*Substack's search tool is maddeningly poor*) or craft a new background paragraph for each article where there's already some existing background.

A second, and even more significant benefit to me is that in creating a Zero Retries Guide page, I'm doing 95% of the work of creating a chapter of my forthcoming (2026 - *I promise!*) book The Zero Retries Guide to Amateur Radio in the 21st Century.

To comment on this article on the Zero Retries email list, [click here](#).

## **ZR > BEACON**

By Steve Stroh N8GNJ

*Short mentions of Zero Retries Interesting items.*

[Random Wire Newsletter Announces EtherHam Website](#)



# ETHERHAM



Image courtesy of etherham.com / Tom Salzer KJ7T

Tom Salzer KJ7T in Random Wire 160:

## [A change for the better](#)

Time for a grand experiment. And what is it? It is a separation of the Random Wire mailing list for this newsletter from the content in the newsletter. Details are available at [A positive change for Random Wire subscribers](#) but here's the TLDR (too long, didn't read): the Random Wire newsletter will continue to be transmitted via Substack subscriptions, but articles will be individually posted at a new website called [EtherHam](#). Reasons for doing this are in the positive change article linked above.

As you read through this newsletter, I think you'll see how this works. There are fewer images in the newsletter, as well as less text. If you want more, just click to get more.

I hope this change will make it easier for subscribers to ingest what's most interesting to them. While it increases my workload slightly, the change will also provide more resiliency to this effort. Let's see how this goes for a bit and then I'll check in with you about whether it is working for you.

In the shorter pieces below, click the section title to read the more complete version at [EtherHam.com](#), or find the *Read More* link at the end of each piece. You can also hit the Like link at the bottom of any article on EtherHam to help others as they consume the content.

**Whew!** This is another “*now* it can be told” development that I couldn’t talk about publicly until now. KJ7T’s development of [EtherHam](#) has been in development for months. I’ve been providing feedback to KJ7T about EtherHam, and I’m glad I can finally confess to knowing about it and help publicize it.

My TL;DR description of EtherHam is “reference for ~~all~~ *most* things related to Amateur Radio Over Internet (AROI). KJ7T, his Random Wire newsletter, and now EtherHam are my go-to references for most things Amateur Radio Over Internet, such as participating in Amateur Radio talk groups via Internet - with, or without, transmitting radio signals on Amateur Radio spectrum.

A great example is KJ7T’s article [Part 2: Getting started with the SharkRF MIKE](#).

***Kudos to KJ7T and congrats on the debut of EtherHam!***

**To comment on this ZR > Beacon item on the Zero Retries email list, [click here](#).**

### **[ARRL to Host 2026 HamSCI Workshop at Central Connecticut State University](#)**

John E. Ross KD8IDJ in the 2025-12-11 issue of ARRL Letter:

ARRL The National Association for Amateur Radio® will host the [9th Annual HamSCI Workshop](#), March 14–15, 2026, at Central Connecticut State University ([CCSU](#)) in New Britain, Connecticut, with activities also occurring at ARRL Headquarters in nearby Newington. Organizers for the Ham Radio Science Citizen Investigation ([HamSCI](#)) community are working hard to put together a memorable event that will bring together amateur radio operators, citizen scientists, students, and professional researchers.

This year’s theme, “Discovering Science Through Ham Radio,” highlights the vibrant intersection of amateur radio and scientific discovery. The 2026 workshop will showcase achievements across the community, including the latest advances in ionospheric research, Personal Space Weather Station development, meteor scatter propagation studies, and the expanding use of technology and techniques for real-time radio propagation sensing.

Participants can expect more than 50 oral and poster presentations, invited tutorials, and a Saturday evening banquet featuring a keynote address from a prominent member of the community. Attendees will also enjoy a visit to ARRL’s national headquarters, with tours of the ARRL Lab, W1HQ Radio Laboratory, and opportunities to get on the air from W1AW – the Hiram P. Maxim Memorial Station. Most attendees will participate in person, with a virtual option to be announced.

See the link for more details about HamSCI 2026. Tina KD7WSF and I attended HamSCI 2025 and we really enjoyed it. The energy of the young student science and technology oriented Amateur Radio Operators was infectious and energizing.

Repeating from my Request To Send editorial at the beginning of this issue:

It’s so cool to see that ARRL has resumed actively sponsoring technical conferences relating to Amateur Radio!

**To comment on this ZR > Beacon item on the Zero Retries email list, [click here](#).**

### **[K1VL SDR - Now With Over 36 \[Web SDR\] Receivers](#)**

A new Web-888 SDR server with six meter capability is now online!

You are seeing this page because all 24 of the K1VL KiwiSDR receivers are at, or near, capacity. If so, please try another of the K1VL servers to see if there’s an available slot. You can also camp on a fully utilized Kiwi server and wait for a slot to become available or you can “listen in” on a current receiver session with limited control.

There is an additional OpenWebRX+ SDR server tuned to 80 meters during nighttime hours (Eastern U.S. time) and 40 meters during daytime hours (Eastern U.S. time) to support many more listeners.

I stumbled onto this site doing background research for Zero Retries. Click the link in the title to see links to K1VL’s web SDRxs.

*This is just what one (motivated and talented) Amateur Radio can offer!*

Followup email with K1VL:

I’m sharing my RF environment with fellow hams and other radio enthusiasts.

I am quite active on AREDN and host a supernode as well. I’m having a blast testing out 802.11ah on 900 MHz and setting up WireGuard connections to access 44Net.

Keep up the good work on Zero Retries!

**To comment on this ZR > Beacon item on the Zero Retries email list, [click here](#).**

### **Remarkably Zero Retries Interesting Issue of ARRL QST - 2026-01**

My friend and Zero Retries Pseudostaffer Ren Roderick KJ7B alerted me to check out the 2026-01 issue of ARRL QST for an article on the

OpenTNC project.

To my surprise, reading through this issue of QST, *there were a number of Zero Retries Interesting articles*. I browse through most issues of QST in a few quick minutes due to the lack of Zero Retries Interesting content.

*But this issue was different, including:*

- A letter - Digital Mode Discovery (about FreeDV RADE being very effective in dealing with the rising noise floor on HF bands in urban areas),
- The OpenTNC: An Open-Source Packet Radio Controller by David Platt AE6EO,
- An Introduction to THz (Optical) Communications by Irwin Math WA2NDM,
- Microwavelengths column - Travel Antennas for Microwaves by Paul Wade W1GHZ,
- A Homemade 6.4-Meter EME Dish by Henryk Kotowski SMØJHF,
- Future-Proofing ARES: Starlink Roam for Support of Deployments by Bob Famiglio K3RF,
- Club Station column - Boosting Engagement with Build Nights by Danny Davis, KD5W,
- Ham Media Playlist column - The Comms Channel by Steve Goodgame K5ATA.

### OpenTNC Project - Pretty Cool

The OpenTNC project is pretty cool and creator David Platt AE6EO did a great job with that article for the QST (and the general Amateur Radio audience)! The overall design and capabilities of the OpenTNC is pretty cool:

- Completely open source design - see [GitLab page](#).
- Five status indicators (a homage to the TAPR TNC-2)
- 1200 bps and 9600 bps data rates
- Incorporates FX.25 Forward Error Correction
- KISS protocol interface
- USB data connection (the Raspberry Pi Pico)
- The compute module is a Raspberry Pi Pico
- “[Deflate data compression](#)” (had to look that up)

See also [The AE6EO OpenTNC project](#) page with some interesting mentions such as

DAMASK packet scheduling mode for KISS- connected nodes

and

#### DAMA

It wouldn't be difficult to add DAMA-slave capability, so that the TNC would honor a “You are connected in DAMA mode” response from the remote peer (DAMA master), and would transmit only immediately after being polled by the master. Unfortunately I lack access to a DAMA-master system to use to test out this mode.

That said...

I'm *encouraged* that ARRL is offering more Zero Retries Interesting content in QST.

I'm *discouraged* that the only folks that will ever get to see that Zero Retries Interesting content in QST is the < 20% (and declining...) of US Amateur Radio Operators that are ARRL members.

I continue to posit that for ARRL and other publishers with periodical material sequestered behind a paywall, their problem *isn't potential piracy* of their content, its that their content, not being viewable easily on the Internet by interested folks, make such content irrelevant to the vast majority of current and potential Amateur Radio Operators.

Thus... *as Zero Retries Interesting as the 2026-01 issue of QST was*, I'm compelled to continue to recommend the [SARC Communicator](#) as an Amateur Radio “magazine” to those new to Amateur Radio... because it has content equivalent to QST articles and columns, and *anyone* can view it without hitting a paywall.

### Discussion About New Packet Radio (NPR)

From a private email discussion - the person didn't give me permission to use their name.

I've read your articles on NPR and I like the idea. But, in many ways I see it as similar to IP400.

The challenge I see with both is the application. What is the problem being solved with this technology? What will attract people to it? Why should they want it?

For example, I'm not sure how many people are using VARA FM for anything beyond WinLink or FLMsg.

I looked at the site selling the NPR hardware, they make no mention of software that supports these modems or the protocols that can take full advantage of the increased speed.

I think this is a problem of engineers designing something because they can. This isn't limited to NPR or IP400. Someone comes up with a great idea, and they make it work, but there isn't a framework around it. Without that framework the technology doesn't help people.

This is the opposite of your Superpeater idea. It is a great idea, I think it would be great. But, there isn't a repeater controller that would support it, nor is there a radio that would fully support it.

Going back to NPR, I think the question needs to be asked. How will hams use these modems in their daily lives? What problem do they solve?

Don't get me wrong, I'm super excited about the technology. I'm just afraid the technology won't be used, not because it doesn't work, rather because there is no application that makes the technology important for hams. Does that make sense?

What are your thoughts?

My response:

Good questions / observations.

NPR is exciting exactly because it isn't a new mode. 😊

It's finally that transparent, high speed bit pipe, implemented on VHF / UHF, that we've needed for a long time.

It's got an Ethernet port for connectivity - not fussy USB with drivers needed, just bog standard Ethernet.

And it uses bog standard TCP/IP for addressing.

Ethernet bits in, RF bits out, and vice versa.

It has just enough native networking to create a digipeater capability if that's needed in a particular local topology.

Keep in mind the original use case that NPR was developed for - an alternative radio access into Europe's HAMNET microwave network. All the fun happens on HAMNET... not because of you buying and using an NPR radio.

All of that will be familiar to NewTechHams - no arcane TNC knowledge to spelunk, no fussing with RS-232 from the previous century, etc.

So we can do anything with NPR that we want. Web server, BBS, email, chat server, etc.

The same is true with AREDN - it's just "Ethernet connectivity" conducted over Amateur Radio spectrum.

As for SuperPeater...

- Yes there is a controller that will support it - it's called a Raspberry Pi 5. 😊 Seriously, everything I envision for SuperPeater is mostly implemented in software and existing (RF / modem) hardware.
- For the user portion, use whatever (fastest) radio you have to uplink, and use a RPi whatever with an RTL-SDR dongle to download. I haven't researched a wideband data mode for the SuperPeater downlink yet, but there are many laying around. Perhaps (I really, really hope) IP400's OFDM mode will emerge to meet this need.

My problem with evangelizing these concepts is that I think best in text... and that only works with a small subset of today's Amateur Radio population. I need to do videos, Videos, VIDEOS... and more videos to walk people through the ideas.

The Zero Retries Guide to New Packet Radio is yet another Zero Retries Guide that's in development. So much fun writing projects, so little time...

[Somebody asked about people's 'unusual hobbies' – 21 bizarre ways to use up your free time](#)

*You'll never guess what the #1 choice of "unusual hobbies / bizarre ways to use up your free time" was 🤔*

‘Amateur Radio (sometimes called Ham Radio). You have to pass a test to then get a license, but it enables you to build your own radio equipment or use pre-made kit and communicate locally or across the world without having to use the internet. If you time it right, you can even contact the astronauts onboard the International Space Station, or use the space station as a relay to then talk to other amateurs. You can bounce signals off the moon, send slow scan TV pictures, send data etc.’  
–Primary\_Choice3351

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## Comments Summary From Previous Issue

*Comments from Zero Retries 0231*

- 13 comments; this will be the last time I feature this section.
  - Comments on battery backup basics.
  - Comments on IPv6 usage.
  - Not writing off HF.
  - YouTube lists (now, you can know what I watch and recommend).
- 

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## Zero Retries Boilerplate

The [Zero Retries Store](#) is now open for business with quality Zero Retries branded merchandise and items being retired from Steve's N8GNJ Labs.

These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham ([The City of Subdued Excitement](#)), Washington, USA, and linked to the Internet via [Starlink Satellite Internet Access](#).

See the **Zero Retries Boilerplate** page for significant acknowledgements and other information relevant to Zero Retries. For new readers of Zero Retries, that page, and the **About Zero Retries** page has useful information to check out.

My ongoing *Thanks* to:

Tina Stroh KD7WSF for, well, *everything*!

Jack Stroh, Late Night Assistant Editor Emeritus

Shrekky Stroh, Late Night Assistant Editor In training

### **Annual Founding Members who generously support Zero Retries financially:**

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**You thousands of readers of Zero Retries** without which there would be little point in publishing this newsletter.

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